

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>2021036PC/ko</b>	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. <b>PCT/FI2003/000540</b>	International filing date (day/month/year) <b>03-07-2003</b>	Priority date (day/month/year) <b>05-07-2002</b>
International Patent Classification (IPC) or national classification and IPC <b>G06F 17/30</b>		
Applicant <b>SYSLORE OY ET AL</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a. ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:
 

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).  
☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

Date of submission of the demand  <b>05-11-2003</b>	Date of completion of this report  <b>17-09-2004</b>
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Form PCT/IPEA/409 (cover sheet) (January 2004)

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2003/000540

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-7</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1-7</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1-7</u>	YES
	Claims	_____	NO

## 2. Citations and explanations (Rule 70.7)

### CITATIONS

The examination process has revealed the following documents:

D1: EP 1052576 A2

D2: US 5377281 A

D3: SHANG, H. et al.: Tries for Approximate String Matching. IEEE Transactions on Knowledge and Data Engineering, vol.8, no.4, August 1996. See pages 540-547, figure 5 and abstract.

D4: US 6377945 B1

D5: UKKONEN, Esko: Finding Approximate Patterns in Strings. Journal of Algorithms 6, 132-137 (1985). See page 132-137 and abstract.

### THE INVENTION

The claimed invention according to claims 1-7 solves the problem of symbol string searching for error-correcting database search, involving the calculation of the smallest possible length difference corresponding to the distance between sample and input symbol strings for selecting the best symbol string.

### STATEMENT

Document D1, which is regarded as being the closest prior art to the subject-matter of the claimed invention, reveals a method for searching for query words among a number of words in a hierarchical data structure having branch and leaf nodes and which has a trie data structure representing number of words, see abstract and claim 1.

According to D1, a trie data structure of symbol strings is created, see figures 2-4. The symbol strings are grouped into

.../...

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

branches so that symbol strings beginning with the same symbols belong to the same branch, see page 4, line 56-page 5, line 4 and figure 3.

When the invention according to D1 receives an input formed of an input symbol string, a search process begin, see page 5, line 12-17.

Further, according to D1, a calculation of probabilities occurs, which appears correspond to the calculation of distances according to the application, see page 5, line 30-31 and figure 4. Thus an optimal path is defined, according to the difference in a reference value, see page 5, line 50-56.

The probabilities for matching have, however, been defined in advance for each symbol (page 4, lines 4 - 23).

The invention according to claim 1 and 5-7 differs from the method in D1 in that D1 fails to teach or suggest that at a calculation point, also the remaining lengths of the symbol strings going through that calculation point should be taken into consideration, or that the remaining lengths of the symbol strings should be compared to the remaining length of the input symbol string.

Document D2 relates to the categorisation of characters and the like with the aid of knowledge sources. One specific area where this invention finds use is optical character recognition (OCR) of text, see abstract.

According to D2, a trie data structure of symbol strings is created, see figure 4. The symbol strings are grouped into branches so that symbol strings beginning with the same symbols belong to the same branch.

A calculation of probabilities occurs according to D2, which appears correspond to the calculation of distances according to the application, see column 7, line 27-36 and figure 4.

However, D2 does not teach or suggest that the remaining length of the input symbol string should be compared to the remaining lengths of symbol strings passing through the calculation point which is being processed, as in the claimed invention.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

The cited documents D1-D5 only disclose the general state of the art, and are not considered to be of particular relevance.

It would not be obvious to a person skilled in the art to apply the features from the cited documents D1-D5 and thus arrive at the invention as revealed in claims 1-7. Therefore, the subject matter of these claims fulfils the requirements of novelty, inventive step and industrial applicability according to PCT Article 33(2,3,4).